

REMARKS

Reconsideration and allowance of this application are respectfully requested.

Claim Status and Amendments

Claims 1, 4-14, 17-22, 25-30, 33-35 and 37-84 are pending. Claims 1, 14, 21, 30, 37, 53, 61, 63 and 74 are independent. Claim 36 has been cancelled without prejudice to or disclaimer of its subject matter. New Claims 63-84 have been added to provide Applicants with a fuller scope of coverage commensurate with their disclosure. It is submitted that support for these claims may be found throughout the originally-filed disclosure. Each set of dependent claims (Claims 64-73 and 75-84) is parallel to original Claims 4-13.

Claims 1, 4, 14, 17, 21, 25, 30, 33, 41 and 42 have been amended to change "surface active component" to "surfactant", which more closely tracks the term used in the specification. See, e.g., pages 25-27. Claims 1, 14, 21 and 30 have been amended to recite that the control means for performing gradational recording by controlling discharge of each of the plurality of inks is based on inputted image data that represents a density level. Applicants submit that this amendment is supported by Figs. 5 and 6 and the description in the specification at page 19, line 6 to page 20, line 5, which

explains that the inputted image data represents a level from 0 to 255.

Accordingly, it is submitted that no new matter has been added by the amendments herein.

Section 112, first paragraph rejection

Claims 1, 4-14, 17-22, 25-30 and 33-36 were rejected under 35 U.S.C. § 112, first paragraph, as allegedly containing subject matter not described in the specification. Applicants respectfully request reconsideration of this rejection.

One aspect of this rejection alleges that the written description does not support the feature that an ink having a relatively high dye density has a lower component ratio of a surfactant than an ink having a relatively low dye density. In addition to the disclosure at page 20, line 6 to page 23, line 17 of the specification, Applicants direct the Examiner's attention to page 26, line 27 to page 27, line 21 of the specification, which discusses the amount of ethylene oxide-type nonionic surfactants that can be added to the inks. Applicants further direct the Examiner's attention to page 30, lines 8-21, which discusses an embodiment using a thick ink and a thin ink for each of a plurality of different colors. Moreover, Applicants note that page 23, line 27 to page 26, line 20 describes the performance of ink compositions and an example of a suitable

surfactant, which are described at page 20, line 6 to page 23, line 17; and also note that page 35, line 7 to page 36, line 21 describes ink compositions according to the second embodiment. In Applicants' view, these passages describe the claimed feature of a plurality of inks containing different component ratios of the surfactant and having different densities and penetrabilities.

Another aspect of the Section 112 rejection alleges that the written description does not specify how the control means performs gradational recording. Applicants direct the Examiner's attention to Item 46 of Figure 4, the image signal processing unit. This unit is further defined in the specification on page 19, line 4 to page 20, line 5. In particular, this passage discusses how the multiple values for controlling gradational recording are obtained and how the values determine whether a high density ink or a low density ink is used. Further support for this feature can be found at page 41, line 26 to page 43, line 20.

A third aspect of the rejection relates to Claim 36. Without conceding the propriety of this rejection of Claim 36, Applicants have cancelled Claim 36, thus rendering this rejection moot.

It is submitted that the present claims comply with all aspects of Section 112, and withdrawal of this rejection is respectfully requested.

Section 101 rejection

Claim 36 was rejected under 35 U.S.C. § 101 as allegedly being directed to non-statutory subject matter. Without conceding the propriety of this rejection, Applicants have cancelled Claim 36, thus rendering this rejection moot.

Section 103 rejections

Claim 36 was rejected under 35 U.S.C. § 103(a) as allegedly obvious over Matsumoto, et al. (U.S. Patent No. 4,860,026) in view of Suzuki (U.S. Patent No. 4,551,736) and Sugimoto, et al. (U.S. Patent No. 5,477,248). Without conceding the propriety of this rejection, Applicants have cancelled Claim 36, thus rendering this rejection moot.

Claims 1, 4-14, 17-22, 25-30 and 33-35 were rejected under 35 U.S.C. § 103(a) as allegedly obvious over Matsumoto, et al. in view of Suzuki and Sugimoto, et al. Claims 37-62 were rejected under 35 U.S.C. § 103(a) as allegedly obvious over Matsumoto, et al. in view of Suzuki, Sugimoto, et al. and Sekiya (JP 1-242256). Applicants respectfully request reconsideration of these rejections.

Before addressing the merits of these rejections, Applicants believe it will be helpful to review some features of the claimed invention.

The present invention uses plural inks having different densities of a same color series. An ink having a low density contains a component that provides the ink with high penetrability and makes the ink diffuse easily; an ink having a high density contains a component that provides the ink with low penetrability and makes the ink diffuse with difficulty.

In this arrangement, the low-density ink suppresses graininess in areas where the image density is low. On the other hand, the high-density ink makes possible the recording of a high-density image, and provides sharpness even at an area where the image density is high.

Accordingly, the density representation of an image is satisfactorily reproduced by affirmatively adjusting the amount of a component of each of the plural inks having different densities. In other words, a satisfactory image can be recorded in both (1) portions where representation is made by using a high density ink and (2) portions where representation is made by using a low density ink.

Applicants submit that the claimed invention is neither taught nor suggested by the cited references.

Matsumoto, et al. discloses a method and apparatus that uses plural inks having different densities (concentrations) in the same color series. The Examiner acknowledges that it does not teach or suggest inks with different dye densities that also have different penetrabilities and surfactants.

Suzuki discloses a method that uses a plurality of inks having different densities of the same color series. Suzuki discloses a technique for substantially equalizing the penetrability of each of plural inks having different densities, in response to the problem that viscosity is differentiated due to a difference of dye density.

Although Suzuki acknowledges that ink viscosity becomes different in accordance with the dye density, Applicants submit that it does not teach or suggest anything about an arrangement for affirmatively making an adjustment so that the penetrability of each of the plural inks of the same color series and having different densities is differentiated by a component contained in the ink, or that penetrability is lowered for an ink having a high density.

Further, Suzuki is intended to equalize the penetrability, which teaches away from the present invention, where penetrabilities are made to be different.

Sugimoto, et al. discloses an apparatus for adjusting an ink component so as to differentiate the penetrability in

accordance with the different colors of the inks. Applicants submit, however, that Sugimoto, et al. does not teach or suggest a plurality of inks having different densities of the same color series. In Applicants' view, the combination of Matsumoto, et al., Suzuki and Sugimoto, et al. would not lead to the present invention: Suzuki teaches away from one of its features.

Sekiya discloses a structure for containing plural inks in a partitioned container. Sekiya is not, however, directed to plural inks having different densities in the same color series. It therefore does not remedy the deficiencies of the combination of the other three references.

Applicants conclude that the claimed invention is not rendered obvious by the cited references, either singly or in the combinations proposed by the Examiner. Applicants therefore respectfully request reconsideration and withdrawal of the Section 103 rejections.

Conclusion

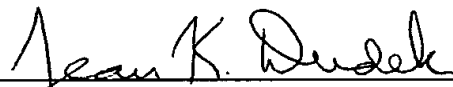
For the foregoing reasons, Applicants submit that the present invention is patentably defined by the independent claims. The dependent claims are also submitted to be patentable because they set forth additional aspects of the present invention and are dependent from the independent claims.

Separate and individual consideration of each dependent claim is respectfully requested.

Applicants submit that this application is in condition for allowance and a Notice of Allowance is respectfully requested.

Applicants' undersigned attorney may be reached in our Washington, D.C. office by telephone at (202) 530-1010. All correspondence should continue to be directed to our below-listed address.

Respectfully submitted,



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